Pentoxylales

Stem – Pentoxyylon sahnii
Leaf - Nipaniophyllum sahnii
Male fructification - Sahnia nipaniensis
Female - Carnoconites compactus
Pentoxyleae

• This unique group of Gymnosperms appeared in the Rajmahal flora was erected by Prof Birbal sahni in 1948
• Sir B.P. Srivastav in 1946 reported a petrified stem which he named as Pentoxylon sahnii.
• Much of the information of this unique group was made available by Birbal sahni, B.P. Srivastav, Vishnu mittre, A.R.Rao, M.N. Bose, and B.D. Sharma
Pentoxylalis

Habit: small trees or shrubs that possessed long and short shoots.

Stem: called Pentoxylon because it frequently showed five segments of triangular vascular tissue arranged in a ring around a central ground tissue. The primary xylem is mesarch and secondary xylem is pycnoxylic (resembling the wood of conifers). The short and long shoot are covered by an armour of spirally arranged leaf bases. The short shoots often terminated in a crown of spirally arranged Nipaniophyllum-type of leaves. Besides foliage leaves some short shoots were terminated by clusters of ovulate cones or pollen organs.
Discovery of Pentoxylales:
This group has been discovered and named as "Pentoxyleae" by well-known Indian Palaeobotanist Professor Birbal Sahni (1948). This is a group of some fossil plants described from Rajmahal Hills in Amrapara District (Santhal Parganas) of Eastern Bihar (India) revealing their existence in Jurassic Period.
Pentoxyylon (stem),

Short: a long-shoot morphology (the diadoc) from to 2 cm diameter. Each node had its own cambium. The cambium was uniformly active in the young stem, but at maturity more secondary tissue developed towards the centre, and thus the secondary wood appeared excentric.

Solute component of Mesrophytes. The primary xylem is srcwh and secondary xylem lypoxylic resembling the wood of eucloria in five to six medullary rays. Research primary xylem strands (Pentoxyylon).

The short and long shoot are covered by an armour of spirally arranged leaf bases.

The short shoots often terminated in a crown of spirally arranged Alnusphyll-type of leaves. Besides foliage leaves, some short shoots were terminated by clusters of
Hippomorphum deekayi leaves are pinnate, strap-shaped with prominent venation. Leaves resemble those of Hippomorphum, Thunnephorum or genera similar to them. However, no anatomically preserved leaves from those genera have been called Hippomorphum.
Sahnia (male flower *Sahnia nipaniensis*)

Pollen organs borne in clusters as short threads. They were present terminally on the stems and fused loosely in a shallow tube. Yellow flowers (150) reported as may as 34 such pollen-bearing organs.

It consisted of a receptacle from whose rim the collar arose numerous microsporophylls or microsporangophores. The male gave rise to secondary leaves that terminated in several stamined pollen sacs.

Each microsporophyll possessed many pear-shaped antheroid sporangia. The terminal position of the sporangium was also occupied by a sporangium.

The snow of the pollen wall is homogeneous while its surface is present in the form of thin cast. In the region of spores, the operculum is highly folded. Sambale & Sambale (1967) observed a few minutes in the region of spores. Other details of the male flowers are yet not fully known.
Carnoconites (female cone)
C. compactum and C. laxum

Ovules aggregated into acorn-shaped clusters. They were radiate to cardate and measured up to about 1.6 cm in C. compactum and 2 cm in C. laxum. They were terminal on branches of C. laxum. Attached to short shoots (branched leafy shoot). The ovules specialized to be ovary-like in angiosperms.

About 30 ovulate scales were present on the ovuliferous cone, and these were on two or three scales. The glandular filaments were not reported to arise from these scales. Tabor (1946) used the word 'cone' for these structures. The ovules were covered by a single integument. The ovules were ray-like from the megasporophylls almost completely surrounded by scales.

Integument has inner achene-like laminated layer and Rocky outer layer.
In some gymnosperms, applied to a type of stoma in which the guard cells are derived from a single mother cell and the subsidiary cells are derived from a different initials.

- Ephedra
- Metallithus
Pentoxylon (stem),

- Short- a long-shoot morphology (the Diodora) from to 2 cm diameter. Each node had its own cambium. The cambium was uniformly active in the young stems, but at maturity more secondary tissue was developed towards the center, and thus the secondary wood appeared eccentric.

- Stems consist of Mesophylls. The primary xylem is xerarch and secondary xylem hyparch, resembling the wood of mulberries in five or six wedges around primary xylem strands (Pentoxylon).

- The short and long shoots are covered by an armour of spirally arranged leaf bases.

- The short shoots often terminated in a crown of spirally arranged Alnusphyllum-type of leaves. Besides foliage leaves, some short shoots were terminated by clusters of
Marasch and paraclear wood. Wood of Syzygium or are classified into marasch or paraclear. The classification is based on the amount of pycnole on the wood.

- Marasch: it is the non-compacted wood with large amount of parenchyma, large pycnole.
- Paraclear: wood compact strong wood with large amount of pycnole.

- Pycnole:
  - Hard: ligneous wood with pycnole hard
  - Medium: ligneous wood with pycnole medium
  - Soft: ligneous wood with pycnole soft

- Groups:
  - Spall
  - Glass
Affinities of Pentoxyylon